Game Animals," but his "Outdoor Pastimes of an American Hunter" (1908) are well worth reading, both for letterpress and illustrations. "Through the Brazilian Wilderness" gives a truthful, though not always exhilarating, description of the Brazilian forest and grassy plains. But there is another side to Theodore Roosevelt, and many an instance of his versatility, in the five volumes of his "Presidential Addresses and State Papers." Probably no head of a State in history has uttered so much sound sense with so much originality of diction and illustration. In Roosevelt we had for the first (and, so far, the only) time a great ruler who was also an adept in the modern sciences, a student and an exponent of the New Bible, a statesman who was extraordinarily well versed in geography—prehistoric, historical, political, physical, and commercial—who was strongly interested in botany, ethnology, zoology, philology, modern history, sociology, and questions of hygiene and the struggle for the supremacy of man over recalcitrant Nature. He gave a great impulse to the research into the causes of yellow fever, and the means of eliminating it from Cuba and Panama. If we only had the luck to acquire a Prime Minister with the learning, the driving force, and the sincerity of Roosevelt, what might not be the after-history of the British Empire, could such a Premier direct its destinies and the education of its governing classes for seven years? But, alas! politics in Britain do not breed Roosevelts.

H. H. JOHNSTON.

NOTES.

WE notice with much pleasure that in the new Government Mr. H. A. L. Fisher will remain the President of the Board of Education and Mr. R. E. Prothero, upon whom a peerage has been conferred, President of the Board of Agriculture. Dr. C. Addison becomes President of the Local Government Board, and is succeeded in what becomes the Ministry of National Service and Reconstruction by Sir Auckland Geddes. Sir Albert Stanley continues President of the Board of Trade. Other appointments are:—Minister of Munitions (to become Minister of Supply), Mr. Andrew Weir, upon whom a peerage has been conferred; Food Controller, Mr. G. H. Roberts; First Commissioner of Works, Sir Alfred Mond. The main changes in the Government, however, are of a political kind, and there is not that breaking away from traditional methods which Mr. Lloyd George may have desired, but found circumstances too strong for him to accomplish. We are glad to note, therefore, that Sir Auckland Geddes, speaking on January 10, stated that "the Prime Minister has decided after long thought—it was undoubtedly reinforced by the finding of Lord Haldane's Committee on the Machinery of Government—that it is absolutely necessary that in the new Government there should be a great organ for research, for investigation, and for the collection of information."

A LONG list of promotions in, and appointments to, the Civil Division of the Order of the British Empire for services in connection with the war was published on January 9. The list includes five Knights Grand Cross of the Order (G.B.E.), six Dames Grand Cross (G.B.E.), forty-nine Knights Commanders (K.B.E.), one hundred and seventy-eight Commanders (C.B.E.), and five hundred and thirty Officers (O.B.E.). We notice the following names of men known in scientific circles:—*K.B.E.:* W. J. Pope, F.R.S., professor of chemistry, University of Cambridge; Aubrey Strahan, F.R.S., director of the Geological Survey of Great Britain; Cecil L. Budd, Non-ferrous Metals Department, Ministry of Munitions; and W. J. Jones, Iron and Steel Production Department, Ministry of Munitions. *C.B.E.:* J. W. Cobb, Livesey professor of coal, gas, and fuel industries, University of Leeds; H. H. Dale, F.R.S., director of pharmacology and chemotherapy under the Medical Research Committee; A. Eichholz, Senior Assistant Medical Officer, Board of Education; J. C. M. Garnett, principal, Municipal College of Technology, Manchester; Lt.-Col. R. J. Harvey-Gibson, professor of botany, University of Liverpool; and P. Chalmers Mitchell, F.R.S., secretary of the Zoological Society of London. *O.B.E.:* J. B. Bailie, professor of philosophy, University of Aberdeen; W. Foord-Kelcey, professor of mathematics and mechanics, Royal Military Academy; and W. E. S. Turner, head of the department of glass technology, University of Sheffield. Numerous medical men are included in the various lists of awards and promotions recently announced, the following being among those mentioned in the *British Medical Journal* for January 11:—*K.C.B.:* Lt.-Gen. T. H. J. C. Goodwin, Director-General, Army Medical Service, and Major-Gen. G. J. H. Evatt. *K.C.M.G.:* Major-Gen. W. W. Pike and Temp. Col. J. Atkins. *K.B.E.:* Col. (temp. Major-Gen.) S. Hickson, Col. H E. B. Bruce-Porter, Col. W. Hale White, Temp. Col. Sir Almroth E. Wright, F.R.S., Temp. hon. Col. J. L. Thomas, Dr. E. N. Burnett, and Dr. G. Archdall Reid. *C.B.:* Temp. Col. A. G. Phear, Temp. Lt.-Col. H. L. Eason, and Capt. and Brevet Major (temp. Col.) R. E. Kelly. *C.M.G.:* Col. H. A. Chisholm, Col. E. J. O'Neill, Temp. Col. (hon. Surg.-Gen.) C. S. Ryan, Lt.-Col. (temp. Col.) S. A. Archer, Lt.-Col. (temp. Col.) E. P. Sewell, Lt.-Col. (acting Col.) H. A. L. Howell, Lt.-Col. C. H. Furnivall, Lt.-Col. F. Marshall, Lt.-Col. C. B. Martin, and Lt.-Col. J. W. West.

THE death of Sir Donald Mackenzie Wallace at the age of seventy-seven removes one of the highest authorities on Russia and the Near East. After several years' residence in Russia, during which he devoted himself to an exhaustive study of the Russian people and Russian problems, Sir Donald Wallace published in 1877 a two-volume work on Russia. This book, which was twice revised by the author, the second time in 1912, still remains one of the standard works on that country. For many years Sir Donald Wallace was special correspondent of the *Times* in Petrograd, Berlin, Constantinople, and elsewhere, being frequently sent on missions to the Balkans and to Egypt. For a time he was private secretary to Lord Dufferin when Viceroy of India. From 1891 to 1899 he was head of the *Times* foreign department, resigning that position to undertake the editorship of the extra volumes of the tenth edition of the Encyclopædia Britannica. For the last few years he lived in retirement, doing a certain amount of work for the *Times*, but devoting himself mainly to study. In addition to his work on Russia, Sir Donald Wallace wrote "Egypt and the Egyptian Question" and "The Web of Empire." The materials for the last-named work were collected by him when he was attached to the suite of King George (then Duke of Cornwall and York) during his tour of the Dominions in 1901.

IN a letter to the *Times* of January 11 Dr. W. J. Fenton, dean of the Charing Cross Hospital Medical School, directs attention to the requirements of medical research. He points out that medical research should not be separated from medical education; that the clinician should be familiar with the work of the laboratory; and that the research worker should not be cut off from the clinical aspects of medical problems. From this it follows that the ideal position for medical research work is at the medical schools associated with the great teaching hospitals, and Dr. Fenton would have the senior student and the newly qualified man undertake some of the more elementary problems of research, not only for the sake of the advancement of knowledge, but also for the invaluable scientific training thereby obtained. Research should demand the whole time of a specially selected body of men, who should be adequately remunerated, and funds should be provided by the State for this and for equipment and assistance. Practical results must not be impatiently demanded, nor should research be exclusively directed towards special objects. It cannot be too strongly emphasised that neither medical research nor medical education can by any means be rendered self-supporting. Any system of grants-in-aid—which may be the best method of State assistance—must be contemplated on a much wider and more generous scale than has been the case hitherto.

INFLUENZA has further decreased in London, and has almost ceased to be epidemic. The Registrar-General's return for the week ending January 4 shows that the deaths only numbered sixty-five, which is fewer than in any week since that ending October 5, 1918. Deaths from influenza for the week ending January 4 were only 5 per cent. of the deaths from all causes, whilst in the weeks ending November 2 and 9 they were 57 per cent. of the total deaths. Sixty-two per cent. of the influenza deaths given in the latest return were between the ages of twenty and sixty-five. The deaths from the epidemic in the ninety-six great towns of England and Wales numbered 441, and were also similarly fewer than in any week since that ending October 5 last. The *Times* of January 10 gives an account of the epidemic in Italy from its correspondent at Rome. "The deputy Signor Monti-Guarnieri has addressed an interrogation to the Government concerning the measures to be taken in view of the recrudescence of the influenza epidemic. The deputy asserts that the epidemic has killed 800,000 people." The *Times* correspondent is of opinion that the estimate is an exaggeration. "This is the third wave of the epidemic. During the first wave the cases were slight, but during the second in October and November they were very severe. A lull came half-way through November, but lately the number of cases has increased again, though the type seems less severe. . . . Everyone will assure you that the deaths from influenza are more numerous than from the war." The correspondent adds: "I hear from one village, which lost sixty-two soldiers in the war, that the deaths there from influenza are nearly 150."

THE representative in the third generation of a great family of botanists, M. Anne Casimir Pyramus De Candolle, died on October 3, 1918, at Geneva, where he was born in 1836, and where the greater part of his life had been spent. Casimir De Candolle was a good botanist, and made valuable additions to the sum of botanical knowledge, though his work was not of such fundamental importance as that of his father, Alphonse, and grandfather, Augustin. He contributed one of the latest volumes (part xvi., 1864–69) to the great systematic work initiated by Augustin P. De Candolle, the "Prodromus Systematis Naturalis Regni Vegetabilis," namely, that dealing with the families Piperaceæ, Juglandeæ, and Myricaceæ, and was associated with Alphonse De Candolle in the issue of the series of monographs (1878–96), "Monographiæ Phanerogamarum," which was to supplement the "Prodromus"; to the first volume (1878) Casimir contributed a monograph of the Meliaceæ. He also wrote numerous taxonomic papers, mainly dealing with the Piperaceæ and Meliaceæ, and though, perhaps, best known as a systematist, he was keenly interested in the morphological and physiological sides of botany. Almost his earliest paper was a study of the morphology and taxonomy of the Juglandeæ, and in 1868 he published a "Théorie de la feuille," in which he interpreted the leaf as a flattened branch; and this was followed at intervals by other papers on leaf-structure and function and on phyllotaxy. Casimir De Candolle had many friends among the older systematists in this country, and workers were always sure of a kindly welcome to the De Candollean herbarium in Geneva. Among his numerous honours he counted the foreign fellowship of our Linnean Society and an honorary doctorate of Aberdeen University.

WE regret to see the report that Sir William Peterson, Principal of McGill University, Montreal, was stricken with paralysis a few days ago while addressing a meeting.

DR. EDGAR T. WHERRY, Bureau of Chemistry, Washington, D.C., has assumed the duties of editor-in-chief of the *American Mineralogist*, in succession to Mr. Wallace Goold Levison, who has retired.

THE second lecture of the series arranged by the Industrial Reconstruction Council will be held in the Saddlers' Hall, Cheapside, E.C.2, on Wednesday, January 22. The chair will be taken at 4.30 by Lord Balfour of Burleigh, and a lecture on "Industrial Reconstruction in Government Departments" will be delivered by his Honour Judge Edward Parry. Applications for tickets should be made to the Secretary, I.R.C., 2 and 4 Tudor Street, E.C.4.

THE council of the Geological Society has this year made the following awards:—Wollaston medal, Sir Aubrey Strahan (Director of H.M. Geological Survey); Murchison medal, Miss Gertrude L. Elles (Newnham College, Cambridge); Lyell medal, Dr. W. F. Hume (Director of the Geological Survey of Egypt); Bigsby medal, Sir Douglas Mawson; Wollaston fund, Dr. Alexander Logie Du Toit (Geological Survey of South Africa); Murchison fund, Mrs. Eleanor M. Reid; and Lyell fund, Mr. John Pringle (Geological Survey of England and Wales) and Dr. Stanley Smith (University College, Aberystwyth).

WITH No. 655, published on January 1, the *Geological Magazine* enters, we may hope, on a still wider field of service. In succession to the *Geologist*, which appeared from 1858 to 1864, this journal has been the recognised medium for the publication and discussion of research in a science that appeals specially to workers in our islands. Some of the contributions to its pages, such as Prof. C. Lapworth's papers on "The Secret of the Highlands," have profoundly affected geological interpretation. Work appearing elsewhere has received review and criticism from a staff of specially qualified writers, and the veteran editor, Dr. Henry Woodward, has infused into a large correspondence his unfailing personal charm. After fifty-five years of devotion to the magazine, he has obtained the help of Mr. R. H. Rastall as sub-editor, and the choice is a guarantee that the literary character of the journal will be maintained. The two most recent numbers may be taken as types of the importance of the *Geological Magazine* in times when it is at length realised that our national progress depends on scientific method and observation. Dr. Prior, for instance, reviews "The Progress of Mineralogy from 1864 to 1918"; the proposed Mines Department for the United Kingdom is discussed; and Mr. Wilcockson gives the best account of "Coal in Spitsbergen" with which we are acquainted. Mr. R. D. Oldham deals with the difficult question of the constitution of the earth's interior, and the palæontological papers, always a strong feature, include one by Dr. Andrews on "Fossil Mammals from Salonica and Imbros," discovered by officers of our Army in moments of relaxation. The *Geological Magazine* is published monthly by Messrs. Dulau and Co., 37 Soho Square, London, at 24*s*. per annum post free. It should find a place in all libraries where British science is to be represented adequately.

THE new map of the Western front issued by Messrs. W. and A. K. Johnston shows the main lines of the retreat and advance of the Allied armies from 1914 to 1918. The map is on a small scale (1 in. to 18 miles), and no relief is shown, but the lines held at different periods during the war are clearly shown in colour. The German territory occupied by the Allies under the terms of the armistice is shaded red, and a deeper tint shows the neutral zone on the right bank of the Rhine. The map, which is published at 1*s*., forms a useful addition to the firm's series of war-maps.

IN the settlement of the complex problems arising from the break-up of the Dual Monarchy, the question of the distribution of the nationalities in Hungary will be of chief importance. Four articles on this subject by Mr. B. C. Wallis have recently appeared in the *Geographical Review* (vol. vi., Nos. 2, 3, 4, and 5). The papers deal respectively with the Rumanians in Hungary, the Slavs of Northern Hungary, the Slavs of Southern Hungary, and the Magyars and Germans in Central Hungary. Three coloured maps accompany each article, showing relief, density of population, and distribution of nationalities respectively. They fit together to form a complete map of Hungary. The population maps are constructed on the contour method, which the author rightly claims gives gradational representation and avoids the abrupt changes characteristic of most maps of this land. Mr. Wallis has been at great pains to unearth from census statistics a great deal of useful information, the text of the articles containing important facts relating to the social and educational state of the people. The work forms a valuable basis for discussions which will shortly be exercising European statesmen.

IN a paper read before the Royal Society of Arts on December 11, Major-Gen. Sir Frederick Smith described the work of the British Army Veterinary Corps at the fronts. Some 1300 officers, 27,000 men, and 6000 coloured men were employed as a corps in the various theatres of war. Every division possessed a mobile veterinary section for immediate service in the field. Thence the wounded and sick animals were forwarded to a veterinary evacuating station, where a more thorough examination was possible and the diagnosis was checked. Two or three times a week the sick were sent on to the base, where they were placed in a reception hospital, whence they were distributed to a general hospital, mange hospital, convalescent depôt, etc., as the case might be. Some 1,317,000 patients passed through the various hospitals during the war (Journ. Roy. Soc. of Arts, December 27, 1918, p. 80).

THE views of Dr. Edridge Green on colour vision are well known, and considerable interest attaches to his application of them to various problems connected with the subjects of protective and warning coloration in birds and insects. In two recent articles (*Science Progress*, July and October, 1918) Mr. Mottram and Dr. Edridge Green have published a careful study of the distribution of colour in five sub-families of Indian diurnal Lepidoptera and two families of birds (the Nectariniidæ and Loriidæ). On the authors' view that the colour-perception of many enemies of insects has not advanced beyond a stage in which green and brown are indistinguishable, the brown and green dimorphism seen in certain groups (as in the larvæ of *Amphidasis betularia*) would be accounted for, the two colours being equally inconspicuous against either kind of background. To such a colour-perception yellow would also be inconspicuous. It is pointed out that complemental colours placed side by side are inconspicuous at long range, but very conspicuous when within their blending distance; hence many "warning" colours are only adapted for use at close quarters. Stress is laid upon what the authors call the "conjuring method" of protection, *i.e.* the sudden disappearance of a bright colour and its replacement by an inconspicuous or deceptive aspect, as in Kallima pursued by an enemy. As a result of a statistical computation, the interesting conclusion is reached that sexual differences from the point of view of colour-vision can be entirely accounted for on the basis of a difference in visibility.

MR. J. WILFRID JACKSON describes the Brachiopoda collected by the British Antarctic (*Terra Nova*) Expedition (*Zool.*, vol. ii., pp. 177–202, 1 plate, 1918) in the New Zealand area and in the Ross Sea. The examples from the latter have enabled the author to make a detailed study of an Antarctic species previously ascribed to the genus Rhynchonella, but for which a new genus, Compsothyris, is formed. No new species has been added to the list of those known to occur in the Antarctic, but our knowledge of the geographical range of those recorded, belonging to the genera Compsothyris, Liothyrella, and Magellania, has been materially extended.

M. E. ROUBAUD discusses (*Rev. gén. des Sci.*, November 15, 1918) the relations between man and mosquitoes with reference to the danger from malaria in France. Anopheles bred from larvæ taken near Paris, fed on cases of benign tertian or of malignant malaria, and kept, some at room-temperature and others at 25° C., were found on dissection to have the developmental forms of the parasite on the stomach or sporozoites in the salivary glands. Isolated cases of malaria and some small epidemics have occurred in France during the last two years, and M. Roubaud states that in regard to the majority of these—chiefly benign tertian, but five were malignant—it has been established that the foci were cases of malaria of colonial or Oriental origin. These facts prove that Anopheles in France, when in contact with malaria-carriers, can become infected, and can transmit the organism. The danger is, however, less in practice than would appear *a priori*, for, in spite of the introduction on a large scale of malaria-carriers, the number of new cases in France since the outbreak of the war has been relatively small—about 250—and this is due, in M. Roubaud's opinion, not to the diminution in the number of Anopheles, but to the relative isolation of man from Anopheles, which has been brought about by improved conditions of living. The ideal conditions —isolated groups of people living in shelters on the ground in sparsely inhabited, humid, and wooded areas—necessary to make the relations between man and Anopheles sufficiently intimate and continuous to bring about endemic malaria are in France found only exceptionally where man has retained or resumed a primitive mode of life. M. Roubaud concludes that human progress has brought about a suspension of the previously intimate relations between man and Anopheles, and, consequently, the disappearance of the old foci of malaria.

"A Whitechapel Botanical Garden" is the subject of an interesting note by Mr. W. Roberts in the *Gardeners' Chronicle* of December 21, 1918. The writer has acquired a sale catalogue of a "Collection of plants, shrubs, and fruit-trees; consisting chiefly of valuable exotics, beautiful flowers, and a large number of pines in full fruit and succession; of Mr. William Bennett, corn factor and biscuit baker, deceased," to be sold on March 27, 1766, at the garden in Whitechapel Fields. Nothing further is known of William Bennett, but the catalogue indicates that the garden was of a very special and interesting nature, and the approximately accurate botanical character of the nomenclature proves that Bennett's interest was as much botanical as horticultural. His garden contained several specimens of many plants which were rare in this country a century and a half ago. Many of the plants in the list were of comparatively recent introduction, and several appear to have been grown by Bennett many years earlier than the dates recorded for their introduction into Great Britain; Mr. Roberts instances *Selago spuria*, *Pisonia aculeata,* and *Ruellia ciliata*. The exotics are from widely different regions, tropical and otherwise. According to a contemporary map, Whitechapel Fields occupied a broad space on the south side of Whitechapel Road and Mile End, extending east from the present-day London Hospital down nearly to Ratcliff Highway. Adjoining them were the Mulberry Gardens.

The recently published issue of the Imperial Institute Bulletin (No. 2, 1918) contains useful articles on South African grasses for paper-making, Ceylon tobacco, and cotton in Egypt. Of the South African grasses, *Andropogon hirtiflorus* is said to be quite suitable for the manufacture of paper pulp on a commercial scale, but the other grasses appear to be of value mainly in South Africa. Tobacco in Ceylon has been taken up with the view of obtaining an improved type of pipe tobacco, and judging from the report, the trials appear to have met with success. With regard to cotton, Mr. G. C. Dudgeon, consulting agriculturist to the Ministry of Agriculture, Egypt, discusses the question of the maintenance of the quality of Egyptian cotton. It is well known that if any serious deterioration in the quality of Egyptian cotton occurred, it would inflict great damage on the British fine cotton spinning industry. Mr. Dudgeon points out that Egyptian cotton has in recent years consisted of a number of varieties of cotton, each an improvement on its predecessor, and each in its turn destined to deterioration through crossing in the fields with inferior kinds. The quality of the cotton produced has, however, on the whole improved, but unless some system of protecting improved kinds is introduced there can be no guarantee that the present good quality of the output can be maintained. The principal action required is the isolation and issue of seed of the best kinds in a fairly pure state, and the steps necessary to this end can be taken by Government only with the consent and active support of the Egyptian producers.

The Bureau of Standards of the United States has issued an emergency edition of its Circular No. 27 on the properties and testing of optical instruments, pending a more complete revision of the circular in a few months. It contains a large amount of information on the design and the principal causes of imperfections of optical instruments not easily accessible to the general public owing to its being scattered widely in optical text-books and periodicals, and to the mathematical form in which it usually appears. The circular deals in succession with definition and resolving power, magnification, brightness of image, and field of view of instruments of observation, with the various aberrations and distortions of instruments for reproduction, and with instruments for measurement. Many of the simpler tests for such instruments are described, so that it is quite possible for the owner of an instrument to test it himself, but in case more complete tests are required the Bureau undertakes them at fees from a dollar upwards. No charge is made for tests undertaken in the public service or in aid of researches for the development of the optical instrument industries of the United States.

In the September issue of the Science Reports of the University of Sendai Prof. K. Honda and Mr. J. Okubo give a new theory of magnetism which agrees more closely with the observed facts of para- and diamagnetism than any previous theory. According to it, the molecular magnets rotate about axes not in general coincident with their magnetic axes. The component of the magnetic moment of a molecule along the axis of rotation the authors call the axial, and that at right angles the transverse, component. When a magnetic field acts on the molecule, precession and nutation take place owing to the axial component of the magnetic moment. The nutation is damped out by thermal impacts amongst the molecules, but the precession continues at an angle which implies increase of magnetic moment in the direction of the field, and the effect is paramagnetic. The transverse component of the moment causes the rotation of the molecule to be faster when that component is in the same direction as the field, and to be slower when in the opposite direction. The time mean of the effect is therefore in the opposite direction to the field —that is, it is diamagnetic. The preponderance of one effect over the other determines the para- or diamagnetic character of the material.

Baumé's hydrometers, especially the one for liquids heavier than water, are largely used in various industries. As is well known, much confusion has arisen in the conversion of the hydrometer readings into terms of specific gravity. This is due to the fact that in graduating the early instruments the temperature of the water used was not given precisely, nor was the density of the "heavier" liquid (a solution of salt) correctly obtained. Hence several different conversion tables have been employed, showing, of course, different specific gravities for the same hydrometer reading. The formula for conversion is: Degrees Baumé $= m - m''$sp. grav., where m is the constant or modulus on which the scale is based, and the uncertainty has been as to the true value of m. The Bureau of Standards, Washington, holds that the value should be 145, and this is now adopted generally in the United States except in the sugar industry. A new conversion table has recently been issued by the Bureau, based on the value mentioned and on the specific gravity determinations of F. Plato, which are regarded as the most accurate. The temperature adopted is 20° C. These features, it is considered, should especially commend the new tables for sugar work. A copy can be obtained free on application to the Bureau (Technologic Paper No. 115).

A REVIEW in NATURE of January 2 of Prof. Cohen's "Organic Chemistry for Advanced Students" contains the statement, in reference to the portion dealing with chlorophyll: "Curiously enough, no mention is made in the list of references to Willstätter and Stoll's book on this subject." This statement applies to the *list* of references on p. 183 (part iii.), but is ambiguous in so far as it suggests that the book is not mentioned elsewhere in the text. The inference is, of course, incorrect, since the book in question receives full mention on p. 172. It is in order to remove any misunderstanding that we are glad to insert this note.

WE have received from Messrs. Watson and Sons (Electro-Medical), Ltd., a pamphlet on radiography and photography. It includes a price-list, but is chiefly an essay on the practice of radiography, and gives just those details that the practitioner wants to know regarding the choice and use of apparatus, the treatment of the plates, and the printing from them. It is a pity that new names should be introduced without a clear statement as to what they signify. We know what amidol, metol, hydroquinone, etc., are, but what is "sutol"?

Messrs. Longmans and Co. have nearly ready "The Quantitative Method in Biology," by Prof. J. MacLeod, of the University of Ghent. *Messrs. Gauthier-Villars* (Paris) have in the press vol. ii. of R. de Forcrand's "Cours de Chimie" (Chimie organique, Chimie analytique), and vol. i. of "Œuvres de Henri Poincaré," 4 vols., vol. ii. of which appeared in 1916.

OUR ASTRONOMICAL COLUMN

THE ORIGIN OF NEW STARS.—In an article which appears in the *Revue Générale des Sciences* (November 30, 1918) Dr. J. Bosler, of the Meudon Observatory, gives an able review of the general phenomena of new stars, and discusses the theories which have been put forward to account for them. The suddenness of the apparition of a nova is considered to be against any explanation based upon radio-activity, and it seems difficult to escape the belief that collisions are in some way concerned in the outburst. The brief duration of novæ, and the relative frequency of their occurrence, appear to be opposed to the direct collision of two dark stars as a probable cause, and Dr. Bosler favours Seeliger's view that a nova is produced by the passage of a dark or faint star through an obscure nebulous cloud. The heating effects would then be merely superficial, as in the case of a meteor in the earth's atmosphere, and a reasonable explanation of the spectroscopic changes can be given. The mutual relations between novæ in their later phases and the Wolf-Rayet stars and planetary nebulæ lead Dr. Bosler to the conclusion that these bodies are merely the vestiges of ancient novæ, and have no place in the ordinary evolutionary sequence.

THE FAYETTE COUNTY METEORITES.—A further investigation of three meteoric stones found in Fayette County, Texas, in 1900, has been made by Mr. G. P. Merrill (Proc. U.S. National Museum, vol. liv., p. 557). Hitherto these stones have been supposed to be a part of the Fayette County (Bluff) stone found in 1878, but it now appears that the two finds are to be regarded as belonging to distinct falls. The most striking difference lies in the physical condition of the prevailing silicates, olivine and enstatite, which are cloudy in the stone of 1878 and clear in that of 1900. Calcium phosphate is present in both, but in the later find lacks the gas cavities which are so conspicuous in the other. There are numerous other points of difference, and the greater weathering of the 1900 stones probably indicates that they belong to an earlier fall. The name Fayette County, Cedar, is suggested for the stones found in 1900.

ECLIPSES AND TRANSITS OF JAPETUS.—The orbit of Japetus, Saturn's eighth satellite, is at present seen edgewise, and eclipses and transits are observable. On January 19d. 14·24h. G.M.T. the shadow of Japetus enters Saturn's disc, passing off below our horizon at 23·09h. On February 27d. 11·62h. Japetus is occulted by Saturn; it remains invisible until 28d. 4·24h., when it emerges from the shadow of the ball to enter the shadow of the inner bright ring at 4·83h. It passes the space corresponding with the Cassini division at 7·19h., emerging from the shadow of the outer ring at 8·49h. It will be remembered that in 1889 Prof. Barnard made a series of observations of its brightness while in the shadow of the crape ring, which gave information about its transparency. Such observations will only be possible in longitudes considerably east of Greenwich, but the passage through the Cassini space and the final emergence are observable here.

Another transit of the shadow across Saturn's disc will occur on April 9, beginning at midnight. The eclipse of May 18 is not observable nearer than western America.

THE SUGAR INDUSTRY IN INDIA AND JAVA.

WITH an area under sugar-cane about one-seventh of that devoted to this crop in India, Java has an annual production of cane-sugar not greatly inferior to that of India, and is able, after meeting its own requirements, to export large quantities, for which India is one of the chief markets. In Java the cultivation of sugar-cane is conducted on the most modern lines, and the manufacture of cane-sugar is carried on in central factories, where the processes are chemically controlled at every stage.

In India the cultivation is in the hands of natives, as is also the preparation of the sugar, and both sides of the industry are conducted in somewhat primitive fashion. The Indian industry has not been left entirely to itself by the Government, and a certain amount of experimental work on the improvement of canes and in the introduction of better methods of preparing sugar has been carried on for some time by the Imperial Department of Agriculture in India and the Indian Provincial Departments closely interested, but so far this work appears to have had but little effect either in increasing the Indian production or in stemming the rising tide of imports. Thus Messrs. Hulme and Sanghi, in a note submitted to the tenth meeting of the Board of Agriculture held at Poona in December, 1917, say that "the rapid increase in the imports of sugar before the war caused some anxiety to those in authority, and steps were taken with the view of improving the sugar industry in India" (Bulletin No. 82, Agricultural Research Institute, Pusa).

One of these steps was the erection of a small experimental factory in 1914–15 at the Government farm at Nawabganj, in the Bareilly district of the United Provinces; the authors of the note referred to are in charge of this small factory, and in the note they give some results of their first two years' work. Sugar-cane is grown as an experimental crop at the farm, and the varieties in cultivation have all been analysed and their milling properties tested at the